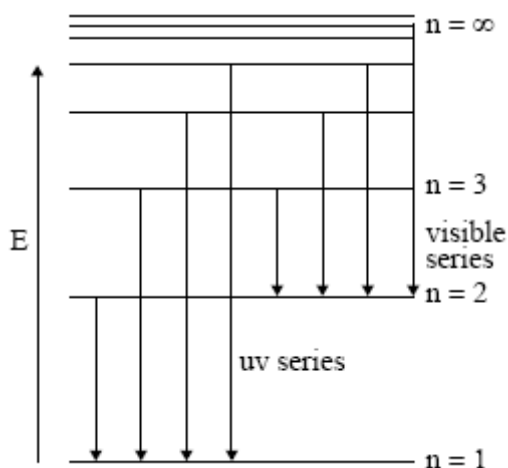


- |     |   |     |
|-----|---|-----|
| 1.  | C | [1] |
| 2.  | A | [1] |
| 3.  | B | [1] |
| 4.  | C | [1] |
| 5.  | B | [1] |
| 6.  | D | [1] |
| 7.  | D | [1] |
| 8.  | B | [1] |
| 9.  | B | [1] |
| 10. | A | [1] |

- |     |     |  |     |
|-----|-----|--|-----|
| 11. | A   |  | [1] |
| 12. | B   |  | [1] |
| 13. | D   |  | [1] |
| 14. | A   |  | [1] |
| 15. | A   |  | [1] |
| 16. | (a) | argon has a greater proportion of heavier isotopes / <i>OWTTE</i> /<br>argon has a greater number of neutrons; | 1   |
|     | (b) | 19 protons <b>and</b> 18 electrons;  | 1   |
|     | (c) | 2, 8, 8;<br><i>Accept <math>1s^2 2s^2 2p^6 3s^2 3p^6</math>.</i>   | 1   |
|     |     |  | [3] |

17.



showing y-axis labelled as energy/E / labelling at least two energy levels;  
 showing a minimum of four energy levels/lines with convergence;  
 showing jumps to  $n = 1$  for ultraviolet series;  
 showing jumps to  $n = 2$  for visible light series;  
*Must show at least two vertical lines per series to score third and fourth mark but penalize once only.*  
*For third and fourth marks if transition not shown from higher to lower energy level penalize only once.*

4

[4]

18. (a)  $IV < I < II < III$

ultra violet radiation < yellow light < red light < infrared radiation;

1

(b) A continuous spectrum has all colours/wavelengths/frequencies whereas a line spectrum has only (lines of) sharp/discrete/specific colours/wavelengths/frequencies;

1

(c) UV-B radiation has shorter wavelength;  
 hence, has higher energy;  
 increases risk of damage to skin cells / OWTTE / causes cancer;

3

[5]